

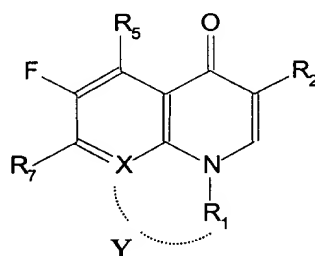
IN THE CLAIMS

198. (New) A method for treating a microbial infection in an animal said infection caused by a microbe, comprising administering to the animal suffering from said infection an antimicrobial agent and an efflux pump inhibitor in an amount sufficient to reduce efflux pump activity,

wherein said efflux pump inhibitor increases the susceptibility of said microbe to said antimicrobial agent, and

wherein said efflux pump inhibitor has the chemical structure of structure I

below:



Structure I

wherein,

R₁ is C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or optionally substituted aryl,

arylS(O)_talkyl, where t is 0;

R₂ is COOR₃, or CONHR₁₃,

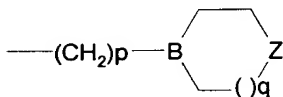
where R₁₃ is the residue of one of the 20 naturally occurring amino acids:

alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aralkyl, $(CH_2)_nCH(R_{14})OC(=O)R_{15}$,

wherein n is 0-6, R_{14} is H; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is



- 5 wherein B is CH or N, and when B is CH, Z is NCH_3 , and when B is N, Z is O, p is 0-2 and q is 0-1;

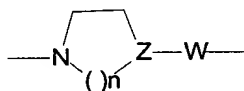
R_5 is H, C_{1-5} alkyl, or amino;

R_7 is Br or F or NR_9R_{10} wherein

R_9 is H and R_{10} is a 5-membered or 6-membered, carbocyclic, bicyclic

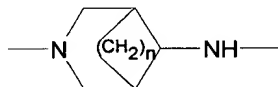
- 10 heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted; with OA, C_1-C_6 alkyl or NR_{16} and R_{17}

- 15 R_{16} and R_{17} are the same or different and represent H, alkanoyl or aminoalkanoyl or R_7 is



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is

- 20 absent;



or

where n is 0, 1, or 2

wherein the R_7 moiety is linked to 2 core molecules of the Formula I to form

- 25 a bis compound

A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

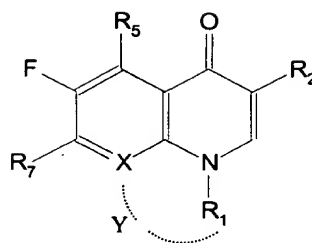
R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

199. (New) A method for prophylactic treatment of an animal at risk for developing a microbial infection by a microbe comprising administering to the animal an antimicrobial agent and an efflux pump inhibitor in an amount sufficient to reduce efflux pump activity, wherein said efflux pump inhibitor increases the susceptibility of said microbe to said antimicrobial agent, and

wherein said efflux pump inhibitor has the chemical structure of structure 1 below:



5

Structure I

wherein,

R_1 is C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl,

arylS(O)_talkyl, where t is 0;

10

R_2 is COOR₃, or CONHR₁₃,

where R_{13} is the residue of one of the 20 naturally occurring amino acids:

alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures

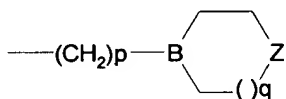
15 thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aralkyl, $(CH_2)_nCH(R_{14})OC(=O)R_{15}$,

wherein n is 0-6, R_{14} is H; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is

20



wherein B is CH or N, and when B is CH, Z is NCH₃, and when B is N, Z is O, p is 0-2 and q is 0-1;

R_5 is H, C_{1-5} alkyl, or amino;

R_7 is Br or F or NR₉ R₁₀ wherein

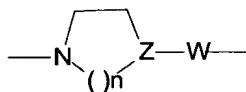
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R_9 is H and R_{10} is a 5-membered or 6-membered, carbocyclic, bicyclic

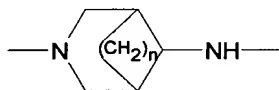
heterocyclic ring linked to the nitrogen of NR₉R₁₀ through an atom of the heterocycle other

than the heterocyclic atom or R₉ and R₁₀ taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted; with OA, C₁-C₆ alkyl or NR₁₆ and R₁₇

5 R₁₆ and R₁₇ are the same or different and represent H, alkanoyl or aminoalkanoyl or R₇ is



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is
10 absent;



or

where n is 0, 1, or 2

wherein the R₇ moiety is linked to 2 core molecules of the Formula I to form
15 a bis compound

A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine,
20 lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-
25 membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y

represents oxygen; represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

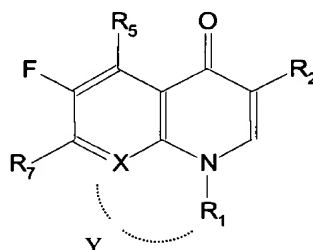
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200. (New) The method of any one of claims 198 or 199 wherein said animal is a mammal.

201. (New) A method of enhancing the antimicrobial activity of an antimicrobial agent
10 against a microbe, comprising contacting said microbe with said antimicrobial agent and an efflux pump inhibitor in an amount effective to inhibit an efflux pump in said microbe,
wherein said efflux pump inhibitor has the chemical structure of structure I

below:

15



wherein,

20

R₁ is C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or optionally substituted aryl,

arylS(O)_talkyl, where t is 0;

R₂ is COOR₃, or CONHR₁₃,

where R₁₃ is the residue of one of the 20 naturally occurring amino acids:

alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine,

histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine,

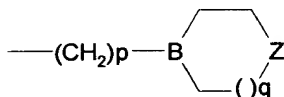
25 tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures

thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aralkyl, $(CH_2)_nCH(R_{14})OC(=O)R_{15}$,

wherein n is 0-6, R_{14} is H; and R_{15} is C_2H_5 or $C(CH_3)_3$;

5 or R_3 is



wherein B is CH or N, and when B is CH, Z is NCH_3 , and when B is N, Z is O, p is 0-2 and q is 0-1;

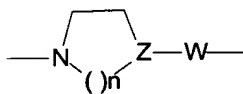
R_5 is H, C_{1-5} alkyl, or amino;

10 R_7 is Br or F or NR_9R_{10} wherein

R_9 is H and R_{10} is a 5-membered or 6-membered, carbocyclic, bicyclic heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted; with OA, C_1-C_6 alkyl or NR_{16} and R_{17}

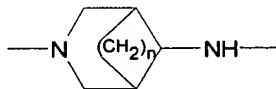
R_{16} and R_{17} are the same or different and represent H, alkanoyl or aminoalkanoyl or R_7 is

20



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is absent;

or



25 where n is 0, 1, or 2

wherein the R₇ moiety is linked to 2 core molecules of the Formula I to form a bis compound

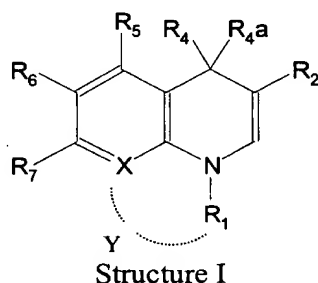
A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

202. (New) The method of suppressing growth of a microbe expressing an efflux pump, comprising contacting said microbe with an efflux pump inhibitor in the presence of a concentration of antimicrobial agent below the MIC of said antimicrobial to said microbe, wherein said efflux pump inhibitor has the chemical structure of structure I below:



wherein,

R_1 is C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl,

arylS(O)_talkyl, where t is 1;

R_2 is COOR₃, or CONHR₁₃,

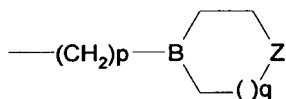
where R_{13} is the residue of one of the 20 naturally occurring amino acids:

5 alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

10 R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aralkyl, $(CH_2)_nCH(R_{14})OC(=O)R_{15}$,

wherein n is 0-6, R_{14} is H; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is



wherein B is CH or N, and when B is CH, Z is NCH_3 , and when B is N, Z is O, p is 0-2

15 and q is 0-1;

R_5 is H, C_{1-5} alkyl, or amino;

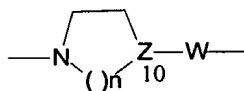
R_7 is Br or F or NR₉ R₁₀ wherein

R_9 is H and R_{10} is a 5-membered or 6-membered, carbocyclic, bicyclic

heterocyclic ring linked to the nitrogen of NR₉R₁₀ through an atom of the heterocycle other
20 than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted; with OA, C_1-C_6 alkyl or NR₁₆ and R_{17}

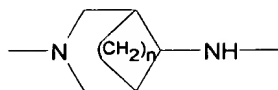
R_{16} and R_{17} are the same or different and represent H, alkanoyl or

25 aminoalkanoyl or R_7 is



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is absent;

or



where n is 0, 1, or 2

wherein the R₇ moiety is linked to 2 core molecules of the Formula I to form a bis compound

A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

203. (New) The method of claims 202, wherein said efflux pump is a Mef A or MefE pump.

204. (New) The method of claim 202, wherein said efflux pump is a NorA, Bmr, PmrA, QacA or QcaB pump.

205. (New) The method of claim 202, wherein said microbe expressing an efflux pump is a Gram negative organism-bearing MexAB-OprM, MexCD-OprJ, MexEF-OprM, MexXY-OprM, ARcrAB-TolC, AcrEF, MarA, SoxS, or/and Tet pump/s.

206. (New) The method of any one of claims 198, 199, 201 or 202, wherein said microbe is a bacterium.

207. (New) The method of claim 206, wherein said bacterium is selected from the group consisting of *Pseudomonas aeruginosa*, *Pseudomonas fluorescens*, *Pseudomonas acidovorans*, *Pseudomonas alcaligenes*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Burkholderia cepacia*, *Burkholderia pseudomallei*, *Aeromonas hydrophilia*, *Escherichia coli*, *Citrobacter freundii*, *Salmonella typhimurium*, *Salmonella enterica* Serovar *typhimurium*, *Salmonella typhi*, *Salmonella paratyphi*, *Salmonella enteritidis*, *Shigella dysenteriae*, *Shigella flexneri*, *Shigella sonnei*, *Enterobacter cloacae*, *Enterobacter aerogenes*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, *Serratia marcescens*, *Francisella tularensis*, *Morganella morganii*, *Proteus mirabilis*, *Proteus vulgaris*, *Providencia alcalifaciens*, *Providencia rettgeri*, *Providencia stuartii*, *Acinetobacter calcoaceticus*, *Acinetobacter haemolyticus*, *Yersinia enterocolitica*, *Yersinia pestis*, *Yersinia pseudotuberculosis*, *Yersinia intermedia*, *Bordetella pertussis*, *Bordetella parapertussis*, *Bordetella bronchiseptica*, *Haemophilus influenzae*, *Haemophilus parainfluenzae*, *Haemophilus haemolyticus*, *Haemophilus parahaemolyticus*, *Haemophilus ducreyi*, *Pasteurella multocida*, *Pasteurella haemolytica*, *Branhamella catarrhalis*, *Helicobacter pylori*, *Campylobacter fetus*, *Campylobacter jejuni*, *Campylobacter coli*, *Borrelia*

burgdorferi, *Vibrio cholerae*, *Vibrio parahaemolyticus*, *Legionella pneumophila*, *Listeria monocytogenes*, *Neisseria gonorrhoeae*, *Neisseria meningitidis*, *Gardnerella vaginalis*, *Bacteroides fragilis*, *Bacteroides distasonis*, *Bacteroides 3452A* homology group, *Bacteroides vulgatus*, *Bacteroides ovalus*, *Bacteroides thetaiotaomicron*, *Bacteroides uniformis*, *Bacteroides eggerthii*, *Bacteroides splanchnicus*, *Clostridium difficile*, *Mycobacterium tuberculosis*, *Mycobacterium avium*, *Mycobacterium intracellulare*, *Mycobacterium leprae*, *Corynebacterium diphtheriae*, *Corynebacterium ulcerans*, *Streptococcus pneumoniae*, *Streptococcus agalactiae*, *Streptococcus pyogenes*, *Enterococcus faecalis*, *Enterococcus faecium* and *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus saprophyticus*, *Staphylococcus intermedius*, *Staphylococcus hyicus* subsp. *hyicus*, *Staphylococcus haemolyticus*, *Staphylococcus hominis*, and *Staphylococcus saccharolyticus*, and *Rickettsia prowazekii*.

208. (New) The method of claim 207, wherein said bacterium is selected from the group consisting of *Streptococcus pneumoniae*, *Streptococcus pyogenes*, *Pseudomonas aeruginosa*, *Escherichia coli*, and *Staphylococcus aureus*.

209. (New) The method of any one of claims 198, 199, 201, or 202, wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.

210. (New) The method of claim 209, wherein said antibacterial agent is a quinolone.

211. (New) The method of claim 209, wherein said antibacterial agent is a tetracycline.

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212. (New) The method of claim 209, wherein said antibacterial agent is a beta-lactam.

213. (New) The method of claim 209, wherein said antibacterial agent is a coumermycin.
- 5 214. (New) The method of claim 209, wherein said antibacterial agent is chloramphenicol.
215. (New) The method of claim 209, wherein said antibacterial agent is a glycopeptide.
- 10 216. (New) The method of claim 209, wherein said antibacterial agent is an aminoglycoside.
217. (New) The method of claim 209, wherein said antibacterial agent is a macrolide.
- 15 218. (New) The method of claim 209, wherein said antibacterial agent is a rifamycin.
219. (New) The method of claim 209, wherein said antibacterial agent is an oxazolidonone.
- 20 220. (New) The method according to claim 200, wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.
221. (New) The method of claim 220, wherein said antibacterial agent is a quinolone.
- 25 222. (New) The method of claim 220, wherein said antibacterial agent is a tetracycline.

223. (New) The method of claim 220, wherein said antibacterial agent is a beta-lactam.

224. (New) The method of claim 220, wherein said antibacterial agent is a coumermycin.

5

225. (New) The method of claim 220, wherein said antibacterial agent is chloramphenicol.

226. (New) The method of claim 220, wherein said antibacterial agent is a glycopeptide.

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227. (New) The method of claim 220, wherein said antibacterial agent is an aminoglycoside.

228. (New) The method of claim 220, wherein said antibacterial agent is a macrolide.

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229. (New) The method of claim 220, wherein said antibacterial agent is a rifamycin.

230. (New) The method of claim 220, wherein said antibacterial agent is an oxazolidonone.

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231. (New) The method according to claim 203, wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.

232. (New) The method of claim 231, wherein said antibacterial agent is a quinolone.

25

233. (New) The method of claim 231, wherein said antibacterial agent is a tetracycline.

234. (New) The method of claim 231, wherein said antibacterial agent is a beta-lactam.
235. (New) The method of claim 231, wherein said antibacterial agent is a
5 coumermycin.
236. (New) The method of claim 231, wherein said antibacterial agent is
chloramphenicol.
- 10 237. (New) The method of claim 231, wherein said antibacterial agent is a glycopeptide.
238. (New) The method of claim 231, wherein said antibacterial agent is an
aminoglycoside.
- 15 239. (New) The method of claim 231, wherein said antibacterial agent is a macrolide.
240. (New) The method of claim 231, wherein said antibacterial agent is a rifamycin.
241. (New) The method of claim 231, wherein said antibacterial agent is an
20 oxazolidonone.
242. (New) The method according to claim 204, wherein said microbial infection is a
bacterial infection and said antimicrobial agent is an antibacterial agent.
- 25 243. (New) The method of claim 242, wherein said antibacterial agent is a quinolone.

244. (New) The method of claim 242, wherein said antibacterial agent is a tetracycline.
245. (New) The method of claim 242, wherein said antibacterial agent is a beta-lactam.
- 5 246. (New) The method of claim 242, wherein said antibacterial agent is a coumermycin.
247. (New) The method of claim 242, wherein said antibacterial agent is chloramphenicol.
- 10 248. (New) The method of claim 242, wherein said antibacterial agent is a glycopeptide.
249. (New) The method of claim 242, wherein said antibacterial agent is an aminoglycoside.
- 15 250. (New) The method of claim 242, wherein said antibacterial agent is a macrolide.
251. (New) The method of claim 242, wherein said antibacterial agent is a rifamycin.
- 20 252. (New) The method of claim 242, wherein said antibacterial agent is an oxazolidonone.
253. (New) The method according to claim 205, wherein said microbial infection is a bacterial infection and said antimicrobial agent is an antibacterial agent.
- 25 254. (New) The method of claim 253, wherein said antibacterial agent is a quinolone.

255. (New) The method of claim 253, wherein said antibacterial agent is a tetracycline.
256. (New) The method of claim 253, wherein said antibacterial agent is a beta-lactam.
- 5 257. (New) The method of claim 253, wherein said antibacterial agent is a coumermycin.
258. (New) The method of claim 253, wherein said antibacterial agent is
10 chloramphenicol.
259. (New) The method of claim 253, wherein said antibacterial agent is a glycopeptide.
260. (New) The method of claim 253, wherein said antibacterial agent is an
15 aminoglycoside.
261. (New) The method of claim 253, wherein said antibacterial agent is a macrolide.
262. (New) The method of claim 253, wherein said antibacterial agent is a rifamycin.
- 20 263. (New) The method of claim 253, wherein said antibacterial agent is an oxazolidonone.
264. (New) The method according to claim 206, wherein said microbial infection is a
25 bacterial infection and said antimicrobial agent is an antibacterial agent.

265. (New) The method of claim 264, wherein said antibacterial agent is a quinolone.
266. (New) The method of claim 264, wherein said antibacterial agent is a tetracycline.
- 5 267. (New) The method of claim 264, wherein said antibacterial agent is a beta-lactam.
268. (New) The method of claim 264, wherein said antibacterial agent is a coumermycin.
- 10 269. (New) The method of claim 264, wherein said antibacterial agent is chloramphenicol.
270. (New) The method of claim 264, wherein said antibacterial agent is a glycopeptide.
- 15 271. (New) The method of claim 264, wherein said antibacterial agent is an aminoglycoside.
272. (New) The method of claim 264, wherein said antibacterial agent is a macrolide.
- 20 273. (New) The method of claim 264, wherein said antibacterial agent is a rifamycin.
274. (New) The method of claim 264, wherein said antibacterial agent is an oxazolidonone.
- 25 275. (New) The method of claim 207, wherein said antibacterial agent is a quinolone.

276. (New) The method of claim 207, wherein said antibacterial agent is a tetracycline.
277. (New) The method of claim 207, wherein said antibacterial agent is a beta-lactam.
- 5 278. (New) The method of claim 207, wherein said antibacterial agent is a coumermycin.
279. (New) The method of claim 207, wherein said antibacterial agent is chloramphenicol.
- 10 280. (New) The method of claim 207, wherein said antibacterial agent is a glycopeptide.
281. (New) The method of claim 207, wherein said antibacterial agent is an aminoglycoside.
- 15 282. (New) The method of claim 207, wherein said antibacterial agent is a macrolide.
283. (New) The method of claim 207, wherein said antibacterial agent is a rifamycin.
- 20 284. (New) The method of claim 207, wherein said antibacterial agent is an oxazolidonone.
285. (New) The method of claim 208, wherein said antibacterial agent is a quinolone.
- 25 286. (New) The method of claim 208, wherein said antibacterial agent is a tetracycline.

287. (New) The method of claim 208, wherein said antibacterial agent is a beta-lactam.

288. (New) The method of claim 208, wherein said antibacterial agent is a coumermycin.

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289. (New) The method of claim 208, wherein said antibacterial agent is chloramphenicol.

290. (New) The method of claim 208, wherein said antibacterial agent is a glycopeptide.

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291. (New) The method of claim 208, wherein said antibacterial agent is an aminoglycoside.

292. (New) The method of claim 208, wherein said antibacterial agent is a macrolide.

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293. (New) The method of claim 208, wherein said antibacterial agent is a rifamycin.

294. (New) The method of claim 208, wherein said antibacterial agent is an oxazolidonone.

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295. (New) The method according to any one of claims 198, 199, 201 or 202, wherein the efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4'-methoxypiperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

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7-Bromo-1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{3,3-dimethyl-4'-ethylamino piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-3'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(dimethylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-4'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3',3'-dimethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3'-aminomethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(3'-aminomethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Ethyl-6,8-difluoro-1,4-dihydro-7-(3'-5'-dimethylpiperazin-1-yl)-4-oxo-
- 20 quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-ethyl-3'-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-5'-dimethyl-4'-ethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-Ethyl-6, 8-difluoro-1, 4-dihydro -7- $\{ (1\alpha, 5\alpha, 6\alpha) \}$ -6'-amino-3'-azabicyclo
 [3.1.0] hex-3'-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-(2',4'-difluorophenyl)-6,8-difluoro-1,4-dihydro-7-(3'-
 aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7- $\{ (3'$ -
 aminoethoxycarbonyl pyrrolidin-3-yl $\}$ -4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3'-ylamino)-4-oxo-
 naphthyridine-3-carboxylic acid and its salts;
- 1-(2',4'-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(piperidin-4'-ylamino)-4-
 10 oxo-naphthyridine-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-(4'-amino-3'-ethylpiperidin-1-yl)-4-
 oxo-naphthyridine-3-carboxylic acid and its salts;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-
 1H,5H-benzo[i,j]quinolizine-2-carboxylic acid 0.2 hydrate;
- 15 (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-
 1H,5H-benzo[i,j]quinolizine-2-carboxylic acid, choline salt;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-
 1H,5H-benzo[i,j]quinolizine-2-carboxylic acid. 1-Hydroxyethylpyrrolidine salt.
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-
 20 1H,5H-benzo[i,j]quinolizine-2-carboxylic acid, Diethanolamine salt;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-
 1H,5H-benzo[i,j]quinolizine-2-carboxylate. L-histidine salt;
- (RS)- (\pm) -9-Fluoro-6,7-dihydro-8- $\{ 4'-(D$ -phenylalanyloxy) piperidin-1-yl $\}$ -5-
 methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4'-(L-α-aspartoxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(±)-9-Fluoro-6,7-dihydro-8-{4'-(L-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid dihydrochloride;

5 (-)-9-Fluoro-6,7-dihydro-8-{4'-(D-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-9-Fluoro-6,7-dihydro-8-{4'-(L-alanyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

10 (R)-(+)-8,9-difluoro-6,7-dihydro-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2- [S-phenylalanyl-S-lysine methyl ester]carboxamide;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-(trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

15 (RS)-(±)-9-Fluoro-6,7-dihydro-8-(cis-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

7-H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(4'-hydroxy-3'-ethylpiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salts; and

20 10-Fluoro-11-[(1α,5α,6α)-6-amino-3-azabicyclo[3.1.0]hex-3-yl]-3,4-dihydro-4(S)-methyl-8-oxo-2H,8H-pyrido[1,2,3-ef]-1,5-benzoxazepine-7-carboxylic acid. Hydrochloride.

296. (New) The method according to any one of claims 198, 199, 201 or 202, wherein the efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-(methylamino)-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

i-Propyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

10 n-Butyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Ethoxycarbonylmethyl 1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-amino-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

15 Benzyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{4'-(t-butoxycarbonyl amino)-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-N-(t-butoxycarbonyl-L-alanyl) amino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

20 1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-L-alanylamino-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(3',3'-dimethyl-4'-(t-butoxy- carbonylvalinylamino)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3',3'-dimethyl-4'-(L)-valyl-aminopiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid hydrochloride;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(L)-aspartylamino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;
- 5 1-Ethyl-6,8-difluoro-1,4-dihydro-7-(4'-ethylaminopiperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(4'-amino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(quinuclidinyl-3-yl-10 amino)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro-7- {(1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-(3'-Fluorophenyl)-6-fluoro-1, 4-dihydro-7-(4'-methylpiperazin-1'-yl)-4-15 oxo-quinoline-3-carboxylic acid and its salts;
- 1-(2,4-Difluorophenyl)-6-fluoro-1, 4-dihydro-7- (4'-ethylaminopiperidin-1'-yl)- 4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-(2',4'-Difluorophenyl)-6-fluoro-5-methyl-1, 4-dihydro-7-(4'-aminopiperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 1-(2',4'-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4'-methylamino piperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7- {(1 α ,5 α ,6 α)-6-amino--N-benzyl-3-25 azabicyclo [3.1.0] hex-6-yl}-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-((1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0]hex-6-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3',3'-dimethyl-4'-hydroxypiperidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

(RS)-(\pm)-9-Fluoro-6,7-dihydro-8-{4'-(L- α -aspartyl-oxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3'-ethyl 4'-hydroxypiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salts;

7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3'-amino methyl-4'-hydroxypiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salt;

1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3',3'-dimethyl-4'-ethylamino piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salt;

1-cyclopropyl-6,7,8-trifluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(3',3'-dimethyl-4'-ethylaminopiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-aminomethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-dimethylamino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-cyclopropylaminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-(t-butoxycarbonyl
(L)-Ala-Ala)amino-3', 3'-dimethyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid
hydrochloride;

5 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-
ethylamino-3', 5'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
Ethyl 1-(2,4-difluorophenyl) -6-fluoro -1, 4-dihydro-7- (4-amino-3-ethylpiperidin-1-yl)- 4-
oxo-1,8-naphthyridine-3-carboxylate;

10 1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4-amino-3, 5-
dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
Ethyl 1-(2,4-difluorophenyl) -6-fluoro-5-methyl-1, 4-dihydro-7- (4-amino-3,
3-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

(S)-(-)-9-fluoro-6,7-dihydro-8- (4'-hydroxy- 3'-fluoropiperidin-1-yl)-5-
methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

15 10-Fluoro-11- (4-aminopiperidin-1-yl)-3,4-dihydro-4 (S)-methyl-8-oxo-2H,
8H-pyrido[1,2,3-ef]-1,5-benzoxazipin-7-carboxylic acid and its salt;

(RS)-(±)-6, 7-dihydro-8- (trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-
methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(RS)-(±)-6, 7-dihydro-8- (cis-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-
1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts; and

20 (RS)-(±)-6, 7-dihydro-8- (4'-hydroxy-3', 3'-dimethylpiperidin-1-yl)-5-
methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts.

297. (New) The method according to any one of claims 198, 199, 201 or 202, wherein the
efflux pump inhibitor is selected from the group consisting of:

- 1-Ethyl-6-fluoro-1, 4-dihydro -7-(1', 2',3',4'-tetrahydroisoquinolin-2-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Ethyl-6, 8-fluoro-1, 4-dihydro -7-(4'-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Ethyl-6, 8-fluoro-1, 4-dihydro -7-(4'-{2'-(2'-oxazolidin-1-yl) ethyl} piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1- Ethyl-6, 8-difluoro-1, 4-dihydro -7-{{(1 α ,5 α ,6 α)-6-amino-3-azabicyclo [3.1.0]-hex-3-yl}}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-(3'-amino-5'-methyl pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-(4'-aminopiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-{4'-(acetamido) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-{{(1 α ,5 α ,6 α)-6'-(t-butoxycarbonyl amino)-3-azabicyclo [3.1.0]-hex-3-yl}}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1, 4-dihydro-7-(3'-acetamido-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 1-Cyclopropyl-6-fluoro-1, 4-dihydro-7-(3'-amino-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro--7-(4'-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro -7-{4'-(dimethylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
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- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-hydroxy-3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',4',5'-trimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',5'-dimethyl-4'-ethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-5-methyl-7-(4'-ethoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 1-Cyclopropyl-6-fluoro-1,4-dihydro-5-methyl-7-(3',3'-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(dimethylamino)-3'-methylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3'-isobutylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3'-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(cis-4'-amino-3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(4'-hydroxy-3'-aminomethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(5'-amino-2'-methyl-pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{3'-(L-Ala-L-Ala) amino pyrrolidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4'-(di-n-butylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4'-(t-butoxycarbonyl-L-Ala-L-Ala)aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'- propionoxy piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'-hydroxy-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-{4'-(1-pyrrolidinyl) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{4'-[(piperidin-4-yl) aminomethyl]-piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{(1,2',2', 6',6'-pentamethyl piperidin-4-yl)methylamino}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-(3',5'-dimethyl morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'-cyclopropyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(3', 5'-dimethyl-4-pivaloyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- Ethyl-6,8-Difluoro-7-(4-hydroxypiperidin-1-yl)-1-(1-phenylthio-3(S)-but-3-yl)-1,4-dihydro-4-oxo-quinoline-3-carboxylate;
- 5 1- (2'-Trifluoromethylphenyl) -6-fluoro-1, 4-dihydro- -7-(3', 3', 4'-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (2'-trifluoromethylphenyl)-6,8-difluoro-1, 4-dihydro -7-(morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (2'-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3',5'-dimethylmorpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 5-Amino-1- (2'-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3',5'-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (4'-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3'-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 1- (4'-Fluorophenyl) -6-fluoro-1,4-dihydro -7-{4'-ethylamino)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1- (2',4'-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3', 5'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (2',4'-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3'-hydroxy-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 5-Amino-1- (2',4'-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3',3'-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-((3'-aminoethoxycarbonyl) pyrrolidin-3-yl)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1- (2',4'-Difluorophenyl) -6-fluoro-1, 4-dihydro -7-(piperidin-4-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

5 Ethyl-1- (2',4'-difluorophenyl) -6-fluoro-1, 4-dihydro -7-{[1 α ,5 α ,6 α]-3-N-benzyl-3-azabicyclo[3.1.0]hex-6-yl-amino}-4-oxo-naphthyridine-3-carboxylate and its salts;

1-(2,4-difluorophenyl) -6-fluoro-7-(1-phenyl-4,5,6,7-tetrahydropyrazolo [4,3-c]pyridin-1-yl-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid and is salts;

10 (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-carboxamidopiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(R)-(+)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid L-arginine salt;

15 (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxy-3',3'-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-N-methylpiperidin-1-yl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

(S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

20 Ethoxycarbonylmethyl (R)-(+)- 9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl)-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid}}-N-3-amino-{7-(1-cyclopropyl)-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid}}-pyrrolidine;

5 N-1-{7-(1-cyclopropyl)-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid}}-N-3-amino-{7-(1-cyclopropyl)-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid}}-pyrrolidine;

N-1-{7-(1-cyclopropyl)-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid}}-N-4-{7-(1-cyclopropyl)-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid}}-piperazine;

10 N-1-{7-(1-cyclopropyl)-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinolone-3-carboxylic acid}}-N-3-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid}}-pyrrolidine;

N-1-{7-(1-cyclopropyl)-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid}}-N-4-amino-{7-(1-cyclopropyl)-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid}}-piperidine;

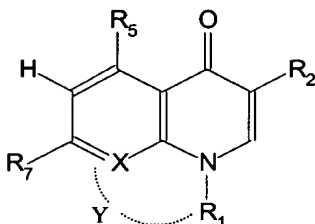
15 N-1-{7-(1-cyclopropyl)-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid}}-N-3-amino-{7-(1-cyclopropyl)-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid}}-pyrrolidine;

20 N-1-{7-(1-(2,4-difluorophenyl)-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid}}-N-4-{7-(1-cyclopropyl)-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid}}-piperazine;

N-3-azabicyclo{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid}}-[1 α ,5 α ,6 α]-N-6-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid}}-[3.1.0] hexane; or

25 N-1-{7-(1-cyclopropyl)-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid}}-N-4-amino-{ethyl 2,3,6-trifluorophenyl-4-carboxylate}}-piperidine.

298. (New) An efflux inhibitor compound, wherein said compound has the chemical structure I below:



wherein,

R_1 is C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl,

arylS(O)_talkyl, where t is 1;

R_2 is COOR₃, or CONHR₁₃,

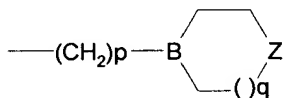
where R_{13} is the residue of one of the 20 naturally occurring amino acids:

alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aralkyl, $(CH_2)_nCH(R_{14})OC(=O)R_{15}$,

wherein n is 0-6, R_{14} is H; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is



wherein B is CH or N, and when B is CH, Z is NCH₃, and when B is N, Z is O, p is 0-2 and q is 0-1;

R_5 is H, C_{1-5} alkyl, or amino;

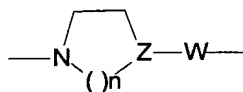
R_7 is Br or F or NR₉ R₁₀ wherein

R_9 is H and R_{10} is a 5-membered or 6-membered, carbocyclic, bicyclic

heterocyclic ring linked to the nitrogen of NR₉R₁₀ through an atom of the heterocycle other

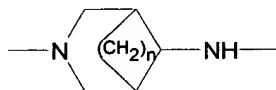
than the heterocyclic atom or R₉ and R₁₀ taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted; with OA, C₁-C₆ alkyl or NR₁₆ and R₁₇

5 R₁₆ and R₁₇ are the same or different and represent H, alkanoyl or aminoalkanoyl or R₇ is



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is
10 absent;

or



where n is 0, 1, or 2

wherein the R₇ moiety is linked to 2 core molecules of the Formula I to form
15 a bis compound

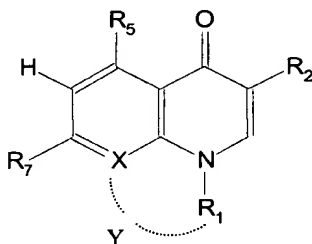
A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-
25 membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

299. (New) An efflux pump inhibitor of the Mef pump wherein said efflux pump inhibitor has the Structure I below



Structure I

wherein,

R_1 is C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl,

arylS(O)_talkyl, where t is 0;

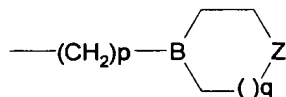
R_2 is $COOR_3$, or $CONHR_{13}$,

where R_{13} is the residue of one of the 20 naturally occurring amino acids: alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aralkyl, $(CH_2)_nCH(R_{14})OC(=O)R_{15}$,

wherein n is 0-6, R_{14} is H; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is



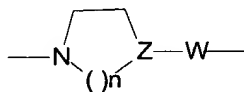
wherein B is CH or N, and when B is CH, Z is NCH_3 , and when B is N, Z is O, p is 0-2 and q is 0-1;

R₅ is H, C₁₋₅ alkyl, or amino;

R₇ is Br or F or NR₉ R₁₀ wherein

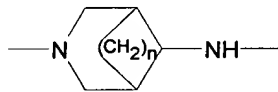
R₉ is H and R₁₀ is a 5-membered or 6-membered, carbocyclic, bicyclic heterocyclic ring linked to the nitrogen of NR₉R₁₀ through an atom of the heterocycle other than the heterocyclic atom or R₉ and R₁₀ taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted; with OA, C₁₋₆ alkyl or NR₁₆ and R₁₇

R₁₆ and R₁₇ are the same or different and represent H, alkanoyl or aminoalkanoyl or R₇ is



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is absent;

15



or

where n is 0, 1, or 2

wherein the R₇ moiety is linked to 2 core molecules of the Formula I to form a bis compound

20

A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

5 and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

300. (New) The efflux pump inhibitor according to claim 299, selected from the group consisting of:

10 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-
(methylamino)-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

15 i-Propyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

n-Butyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Ethoxycarbonylmethyl 1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-
20 (4'-amino-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Benzyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{4'-(t-butoxycarbonyl amino)-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-N-(t-butoxycarbonyl-L-alanyl) amino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-L-alanyl-amino-3',3'-dimethylpiperidin-1-)-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(3',3'-dimethyl-4'-(t-butoxy-carbonylvalinyl-amino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(3',3'-dimethyl-4'-(L)-valyl-aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(L)-aspartyl-amino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(4'-ethylaminopiperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(4'-amino-3'-methylpiperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(quinuclidinyl-3-yl-amino)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro-7- {(1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(3'-Fluorophenyl)-6-fluoro -1, 4-dihydro -7-(4'-methylpiperazin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4'-ethylaminopiperidin-1'-yl)- 4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-(2',4'-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4'-aminopiperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-(2',4'-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4'-methylamino piperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-((1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 10 1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-((1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0]hex-6-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3',3'-dimethyl-4'-hydroxy piperidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 15 (RS)-(\pm)-9-Fluoro-6,7-dihydro-8-{4'-(L- α -aspartyl oxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;
- 7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3'-ethyl 4'-hydroxypiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salts;
- 20 7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3'-amino methyl-4'-hydroxypiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salt;
- 1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3',3'-dimethyl-4'-ethylamino piperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salt;
- 1-Cyclopropyl-6,7,8-trifluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid;
- 25

(S)-(-)-9-Fluoro-6,7-dihydro-8- (3', 3'-dimethyl-4'-ethylaminopiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (3'-aminomethyl-4'-hydroxypiperidin 1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5 1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (4'-dimethylamino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7- {4'-cyclopropylaminopiperidin-1-yl} -4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-(t-butoxycarbonyl (L)-Ala-Ala)amino-3', 3'-dimethyl piperidin-1-yl} -4-oxo-quinoline-3-carboxylic acid

10 hydrochloride;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7- {4'-ethylamino-3', 5'-dimethylpiperidin-1-yl} -4-oxo-quinoline-3-carboxylic acid and its salts;

Ethyl- 1-(2,4-difluorophenyl) -6-fluoro -1, 4-dihydro-7- (4-amino-3-ethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

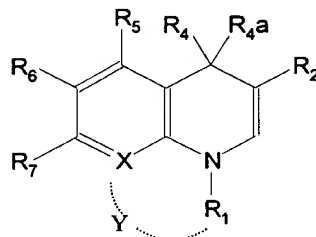
15 1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4-amino-3, 5-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;

Ethyl 1-(2,4-difluorophenyl) -6-fluoro-5-methyl-1, 4-dihydro-7- (4-amino-3, 3-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;

20 (S)-(-)-9-fluoro-6.7-dihydro-8- (4'-hydroxy- 3'-fluoropiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts; and

10-Fluoro-11- (4-aminopiperidin-1-yl)-3,4-dihydro-4 (S)-methyl-8-oxo-2H, 8H-pyrido[1,2,3-ef]-1,5-benzoxazin-7-carboxylic acid and its salt.

301. (New) An efflux pump inhibitor of the NorA, Bmr, PmrA, QacA and/or QacB pump/s wherein said efflux pump inhibitor has the Structure I below



Structure I

wherein,

R_1 is C_{1-6} alkyl, C_{3-6} cycloalkyl, or optionally substituted aryl, arylS(O)_talkyl, where t is 1;

R_2 is $COOR_3$, or $CONHR_{13}$,

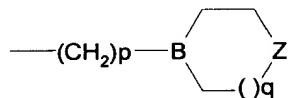
where R_{13} is the residue of one of the 20 naturally occurring amino acids:

alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aralkyl, $(CH_2)_nCH(R_{14})OC(=O)R_{15}$,

wherein n is 0-6, R_{14} is H; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is



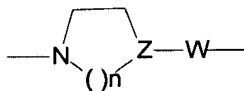
wherein B is CH or N, and when B is CH, Z is NCH_3 , and when B is N, Z is O, p is 0-2 and q is 0-1;

R_5 is H, C_{1-5} alkyl, or amino;

R₇ is Br or F or NR₉ R₁₀ wherein

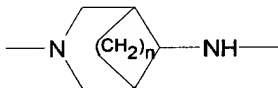
R₉ is H and R₁₀ is a 5-membered or 6-membered, carbocyclic, bicyclic heterocyclic ring linked to the nitrogen of NR₉R₁₀ through an atom of the heterocycle other than the heterocyclic atom or R₉ and R₁₀ taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted; with OA, C₁-C₆ alkyl or NR₁₆ and R₁₇

R₁₆ and R₁₇ are the same or different and represent H, alkanoyl or aminoalkanoyl or R₇ is



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is absent;

or



where n is 0, 1, or 2

wherein the R₇ moiety is linked to 2 core molecules of the Formula I to form a bis compound

A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

5 and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

302. (New) The efflux pump inhibitor according to claim 301, selected from the group consisting of:

10 1-Ethyl-6-fluoro-1, 4-dihydro -7-(1', 2',3',4'-tetrahydroisoquinolin-2-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6,8-fluoro-1, 4-dihydro -7-(4'-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6,8-fluoro-1, 4-dihydro -7-(4'-{2'-(2'-oxazolidin-1-yl) ethyl} piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1 α ,5 α ,6 α)-6-amino-3-azabicyclo [3.1.0]-hex-3-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-(3'-amino-5'-methyl pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

20 5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-(4'-aminopiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-{4'-(acetamido) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-ethyl-6,8-difluoro-1,4-dihydro-7-((1 α ,5 α ,6 α)-6'-(t-butoxycarbonyl amino)-3-azabicyclo [3.1.0]-hex-3-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-acetamido-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-amino-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-{4'-(dimethylamino) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-hydroxy-3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',4',5'-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',5'-dimethyl-4'-ethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-5-methyl-7-(4'-ethoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-5-methyl-7-(3',3'-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(dimethylamino)-3'-methyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3'-isobutyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3',3'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3',5'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3'-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(cis-4'-amino-10 3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(4'-hydroxy-3'-aminomethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(5'-amino-2'-methyl-pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{3'-(L-Ala-L-Ala) amino pyrrolidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4'-(di-n-butylamino) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4'-(t-butoxycarbonyl-20 L-Ala-L-Ala)aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'- propionoxy piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'-hydroxy-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-{4'-(1-pyrrolidinyl) piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{4'-[(piperidin-4-yl) aminomethyl]-piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{(1,2',2', 6',6'-pentamethyl piperidin-4-yl)methylamino}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-(3',5'-dimethyl morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'-cyclopropyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(3', 5'-dimethyl-4-pivaloyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- Ethyl-6,8-Difluoro-7-(4-hydroxypiperidin-1-yl)-1-(1-phenylthio-3(S)-but-3-yl)-1,4-dihydro-4-oxo-quinoline-3-carboxylate;
- 15 1-(2'-Trifluoromethylphenyl) -6-fluoro-1, 4-dihydro- -7-(3', 3', 4'-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (2'-trifluoromethylphenyl)-6,8-difluoro-1, 4-dihydro -7-(morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (2'-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3',5'-dimethylmorpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 5-Amino-1- (2'-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3',5'-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (4'-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3'-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 1- (4'-Fluorophenyl) -6-fluoro-1,4-dihydro -7-{4'-ethylamino)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1- (2',4'-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3', 5'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 5-Amino-1- (2',4'-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3'-hydroxy-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (2',4'-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3',3'-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-{(3'-aminoethoxycarbonyl) pyrrolidin-3-yl}-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- 10 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- 1- (2',4'-Difluorophenyl) -6-fluoro-1, 4-dihydro -7-(piperidin-4-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- 15 Ethyl-1- (2',4'-difluorophenyl) -6-fluoro-1, 4-dihydro -7-{[1 α ,5 α ,6 α]-3-N-benzyl-3-azabicyclo[3.1.0]hex-6-yl-amino}-4-oxo-naphthyridine-3-carboxylate and its salts;
- 1-(2,4-difluorophenyl) -6-fluoro-7-(1-phenyl-4,5,6,7-tetrahydropyrazolo [4,3-c]pyridin-1-yl)-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid and is salts;
- 20 (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-carboxamidopiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- (R)-(+)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid L-arginine salt;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxy-3',3'-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- 25

- (S)-(-)-N-methylpiperidin-1-yl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;
- (S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;
- 5 Ethoxycarbonylmethyl (R)-(+)- 9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;
- N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-pyrrolidine;
- 10 N-1-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-pyrrolidine;
- N-1-{7-(1-cyclopropyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl -6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;
- 15 N-1-{7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-4-{7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;
- N-1-{7-(1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl) -6-fluoro- 1, 4-dihydro-4-oxo-1, 8-naphthyridine-3-carboxylic acid)}-pyrrolidine;
- 20 N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperidine;

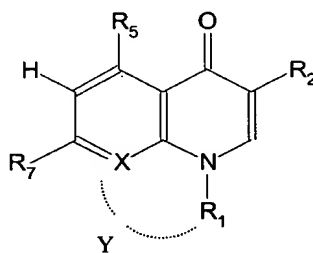
N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino{7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;

N-1- {7-(1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid)}-N-4- {7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;

N-3-azabicyclo{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-[1 α ,5 α ,6 α]-N-6-amino-{7-1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-[3.1.0] hexane; and

N-1- {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino-{ethyl 2,3,6-trifluorophenyl-4-carboxylate}-piperidine.

303. (New) An efflux pump inhibitor of the MexAB-OprM, MexCD-OprJ, MexEF-OprM, MexXY-OprM, AcrAB-TolC, AcrEF, MarA, SoxS and/or Tet pump/s, wherein said efflux pump inhibitor has the Structure I below



wherein,

R₁ is C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or optionally substituted aryl, arylS(O)_talkyl, where t is 0;

R₂ is COOR₃, or CONHR₁₃,

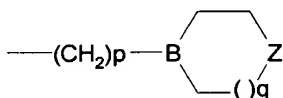
where R₁₃ is the residue of one of the 20 naturally occurring amino acids:

alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl residues;

R_3 is H, C_{1-6} alkyl, C_{3-6} cycloalkyl, aralkyl, $(CH_2)_nCH(R_{14})OC(=O)R_{15}$,

wherein n is 0-6, R_{14} is H; and R_{15} is C_2H_5 or $C(CH_3)_3$;

or R_3 is



wherein B is CH or N, and when B is CH, Z is NCH_3 , and when B is N, Z is O, p is 0-2 and q is 0-1;

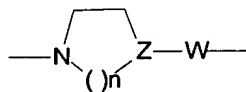
R_5 is H, C_{1-5} alkyl, or amino;

R_7 is Br or F or NR_9R_{10} wherein

R_9 is H and R_{10} is a 5-membered or 6-membered, carbocyclic, bicyclic

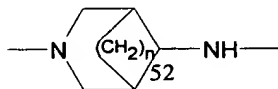
heterocyclic ring linked to the nitrogen of NR_9R_{10} through an atom of the heterocycle other than the heterocyclic atom or R_9 and R_{10} taken together with the nitrogen atom to which they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic, and said carbocycle or heterocycle is optionally substituted; with OA, C_1-C_6 alkyl or NR_{16} and R_{17}

R_{16} and R_{17} are the same or different and represent H, alkanoyl or aminoalkanoyl or R_7 is



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is absent;

or



where n is 0, 1, or 2

wherein the R₇ moiety is linked to 2 core molecules of the Formula I to form a bis compound

5 A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20 naturally occurring amino acids or the optically active isomers thereof, or the racemic mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine, aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

15 and its pharmaceutically acceptable salts, hydrates, polymorphs and pseudopolymorphs.

304. (New) The efflux pump inhibitor according to claim 303, selected from the group consisting of:

20

1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4'-methoxypiperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

7-Bromo-1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid and its salts;

25 1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-amino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{3,3-dimethyl-4'-ethylamino piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-3'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(dimethylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-4'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3',3'-dimethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3'-aminomethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(3'-aminomethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Ethyl-6,8-difluoro-1,4-dihydro-7-(3'-5'-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-ethyl-3'-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-5'-dimethyl-4'-ethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Ethyl-6, 8-difluoro-1, 4-dihydro-7-{(1 α ,5 α ,6 α)-6'-amino-3'-azabicyclo [3.1.0] hex-3'-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-(2',4'-difluorophenyl)-6,8-difluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-((3'-aminoethoxycarbonyl pyrrolidin-3-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3'-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-(2',4'-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(piperidin-4'-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-amino-3'-ethylpiperidin-1-yl)-4-oxo-naphthyridine-3-carboxylic acid and its salts;

10 (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid 0.2 hydrate;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-{4'-(D-phenylalanyloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

15 (RS)-(±)-9-Fluoro-6,7-dihydro-8-{4'-(L-α-aspartylloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(±)-9-Fluoro-6,7-dihydro-8-{4'-(L-leucylloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid dihydrochloride;

(-)-9-Fluoro-6,7-dihydro-8-{4'-(D-leucylloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

20 (S)-(-)-9-Fluoro-6,7-dihydro-8-{4'-(L-alanyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

(S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

(R)-(+)-8,9-difluoro-6,7-dihydro-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2- [S-phenylalanyl-S-lysine methyl ester]carboxamide;

(RS)-(±)-9-Fluoro-6,7-dihydro-8-(trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

5 (RS)-(±)-9-Fluoro-6,7-dihydro-8-(cis-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-9-Fluoro-6,7-dihydro-8-(trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

10 7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(4'-hydroxy-3'-ethylpiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salts; and

10-Fluoro-11-[(1 α ,5 α ,6 α)-6-amino-3-azabicyclo[3.1.0]hex-3-yl]-3,4-dihydro-4(S)-methyl-8-oxo-2H,8H-pyrido[1,2,3-ef]-1,5-benzoxazepine-7-carboxylic acid, Hydrochloride.

15 305. (New) A pharmaceutical composition effective for treatment of an infection by a microbe in an animal, comprising an efflux pump inhibitor and a pharmaceutically acceptable carrier, wherein said efflux pump inhibitor has the chemical structure of structure I below:



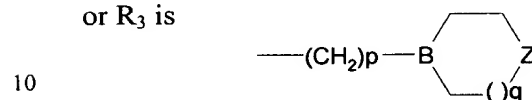
wherein,

R₁ is C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or optionally substituted aryl,
25 arylS(O)_talkyl, where t is 0;
R₂ is COOR₃, or CONHR₁₃,

where R₁₃ is the residue of one of the 20 naturally occurring amino acids:
 alanine, arginine, asparagines, aspartic acid, cysteine, glutamine, glutamic acid, glycine,
 histidine, isoleucine, leucine, lysine, methionine, phenylalanine, proline, serine, threonine,
 tryptophan, tyrosine, valine or the optically active isomers thereof or the racemic mixtures
 thereof, or combinations of these amino acids to give dipeptidyl, tripeptidyl or polypeptidyl
 residues;

R₃ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, aralkyl, (CH₂)_nCH(R₁₄)OC(=O)R₁₅,
 wherein n is 0-6, R₁₄ is H; and R₁₅ is C₂H₅ or C(CH₃)₃;

or R₃ is



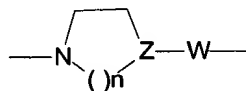
wherein B is CH or N, and when B is CH, Z is NCH₃, and when B is N, Z is O, p is 0-2
 and q is 0-1;

R₅ is H, C₁₋₅ alkyl, or amino;

R₇ is Br or F or NR₉ R₁₀ wherein

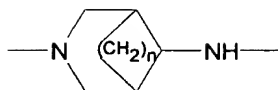
15 R₉ is H and R₁₀ is a 5-membered or 6-membered, carbocyclic, bicyclic
 heterocyclic ring linked to the nitrogen of NR₉R₁₀ through an atom of the heterocycle other
 than the heterocyclic atom or R₉ and R₁₀ taken together with the nitrogen atom to which
 they are attached form part of a heterocycle which heterocycle is monocyclic or bicyclic,
 and said carbocycle or heterocycle is optionally substituted; with OA, C₁-C₆ alkyl or NR₁₆
 20 and R₁₇

R₁₆ and R₁₇ are the same or different and represent H, alkanoyl or
 aminoalkanoyl or R₇ is



where n is 1, 2 or 3, Z is CH or N, and when Z is CH, W is NH or when Z is N, W is
 absent;

or



where n is 0, 1, or 2

wherein the R₇ moiety is linked to 2 core molecules of the Formula I to form
5 a bis compound

A is H, C₁₋₆ alkyl, C₁₋₆ alkanoyl or aminoalkanoyl wherein the
aminoalkanoyl group may be an aminoacid residue derived from one of the one of the 20
naturally occurring amino acids or the optically active isomers thereof, or the racemic
mixtures thereof wherein the amino residue is derived from alanine, arginine, asparagine,
10 aspartic acid, cysteine, glutamine, glutamic acid, glycine, histidine, isoleucine, leucine,
lysine, methionine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, or valine;

R₁₁ is H, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, or heterocyclic group,

X is CH, C-F, C-OCH₃, N or when X is equal to C, H forms together with
the nitrogen atom of the adjacent ring an optionally substituted 6-membered ring, or 7-
15 membered ring, containing carbon atoms and optionally a heteroatom Y, wherein Y
represents oxygen; if the ring is substituted, the substituent is a C₁₋₆ alkyl group;

and its pharmaceutically acceptable salts, hydrates, polymorphs and
pseudopolymorphs.

20 306. (New) The pharmaceutical composition of claim 305, further comprising an
antimicrobial agent.

307. (New) The pharmaceutical composition of claim 306, wherein said antimicrobial
agent is an antibacterial agent.

25

308. (New) The pharmaceutical composition of claim 305, further comprising a macrolide or a ketolide.

309. (New) The pharmaceutical composition of claim 308, wherein said macrolide or ketolide is selected from the group consisting of azithromycin, telithromycin, clarithromycin, erythromycin, rokitamycin, roxithromycin, spiramycin and josamycin.

310. (New) The pharmaceutical composition of claim 305, wherein the efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-(methylamino)-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

i-Propyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

n-Butyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Ethoxycarbonylmethyl 1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-amino-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Benzyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{4'-(t-butoxycarbonyl amino)-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

- 1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-N-(t-butoxycarbonyl-L-alanyl) amino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-L-alanylamino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(3',3'-dimethyl-4'-(t-butoxy- carbonylvalinylamino)piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(3',3'-dimethyl-4'-(L)-valyl-aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(L)-aspartylamino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;
- 1-Ethyl-6,8-difluoro-1,4-dihydro-7-(4'-ethylaminopiperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(4'-amino-3'-methyl piperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(quinuclidinyl-3-yl-amino)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro-7- {(1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-(3'-Fluorophenyl)-6-fluoro -1, 4-dihydro -7-(4'-methylpiperazin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4'-ethylaminopiperidin-1'-yl)- 4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-(2',4'-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4'-aminopiperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-(2',4'-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4'-methylamino piperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-((1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 10 1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-((1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0]hex-6-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3',3'-dimethyl-4'-hydroxy piperidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 15 (RS)-(\pm)-9-Fluoro-6,7-dihydro-8-(4'-(L- α -aspartyl-oxy)piperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;
- 7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3'-ethyl 4'-hydroxypiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salts;
- 20 7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3'-amino methyl-4'-hydroxypiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salt;
- 1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3',3'-dimethyl-4'-ethylamino piperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salt;
- 1-cyclopropyl-6,7,8-trifluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid;
- 25

- (S)-(-)-9-Fluoro-6,7-dihydro-8- (3', 3'-dimethyl-4'-ethylaminopiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (3'-aminomethyl-4'-hydroxypiperidin 1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (4'-dimethylamino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-cyclopropylaminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-(t-butoxycarbonyl
- 10 (L)-Ala-Ala)amino-3', 3'-dimethyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;
- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-ethylamino-3', 5'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- Ethyl 1-(2,4-difluorophenyl) -6-fluoro -1, 4-dihydro-7- (4-amino-3-ethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;
- 15 1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4-amino-3, 5-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- Ethyl 1-(2,4-difluorophenyl) -6-fluoro-5-methyl-1, 4-dihydro-7- (4-amino-3, 3-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;
- 20 (S)-(-)-9-fluoro-6,7-dihydro-8- (4'-hydroxy- 3'-fluoropiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- 10-Fluoro-11- (4-aminopiperidin-1-yl)-3,4-dihydro-4 (S)-methyl-8-oxo-2H, 8H-pyrido[1,2,3-ef]-1,5-benzoxazipin-7-carboxylic acid and its salt;
- (RS)-(±)-6, 7-dihydro-8- (trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- 25

(RS)-(±)-6, 7-dihydro-8- (cis-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts; and

(RS)-(±)-6, 7-dihydro-8- (4'-hydroxy-3', 3'-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts.

5

311. (New) The pharmaceutical composition of claim 309, wherein the efflux pump inhibitor is selected from the group consisting of:

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

10 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-(methylamino)-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

i-Propyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

15 n-Butyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(4'-amino-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

Ethoxycarbonylmethyl 1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-amino-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

20 Benzyl 1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-{4'-(t-butoxycarbonyl amino)-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylate and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-N-(t-butoxycarbonyl-L-alanyl) amino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-L-alanyl-amino-3',3'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(3',3'-dimethyl-4'-(t-butoxy- carbonylvalinyl-amino)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro -7-(3',3'-dimethyl-4'-(L)-valyl-aminopiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(L)-aspartyl-amino-3',3'-dimethylpiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid hydrochloride;

1-Ethyl-6,8-difluoro-1,4-dihydro-7-(4'-ethylaminopiperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(4'-amino-3'-methylpiperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(quinuclidinyl-3-yl-amino)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro-7- {(1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(3'-Fluorophenyl)-6-fluoro -1, 4-dihydro -7-(4'-methylpiperazin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4'-ethylaminopiperidin-1'-yl)- 4-oxo-quinoline-3-carboxylic acid and its salts;

1-(2',4'-Difluorophenyl)-6-fluoro-5-methyl-1, 4-dihydro -7-(4'-aminopiperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-(2',4'-Difluorophenyl)-6-fluoro-5-methyl-1,4-dihydro-7-(4'-methylamino piperidin-1'-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-{{(1 α ,5 α ,6 α)-6-amino--N-benzyl-3-azabicyclo [3.1.0] hex-6-yl}}-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3'-aminopyrrolidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 1-(2,4-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-{{(1 α ,5 α ,6 α)-6-amino-N-benzyl-3-azabicyclo [3.1.0]hex-6-yl}}- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 10 salts;
- 1-(2,4-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(3',3'-dimethyl-4'-hydroxy piperidin-1'-yl)-4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- (RS)-(±)-9-Fluoro-6, 7-dihydro-8-{4'-(L- α -aspartoxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;
- 15 7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(3'-ethyl 4'-hydroxypiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salts;
- 7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2, 3-dihydro-3-methyl-10-(3'-amino methyl-4'-hydroxypiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salt;
- 20 1-Cyclopropyl-6, 8-difluoro-5-methyl-1, 4-dihydro -7-(3', 3'-dimethyl-4'-ethylamino piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salt;
- 1-cyclopropyl-6,7,8-trifluoro-5-methyl-1,4-dihydro - 4-oxo-quinoline-3-carboxylic acid;
- (S)-(-)-9-Fluoro-6,7-dihydro-8- (3', 3'-dimethyl-4'-ethylaminopiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- 25

- 1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (3'-aminomethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1, 4-dihydro-7- (4'-dimethylamino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7- {4'-cyclopropylaminopiperidin-1-yl} -4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-(t-butoxycarbonyl (L)-Ala-Ala)amino-3', 3'-dimethyl piperidin-1-yl} -4-oxo-quinoline-3-carboxylic acid hydrochloride;
- 10 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-{4'-ethylamino-3', 5'-dimethylpiperidin-1-yl} -4-oxo-quinoline-3-carboxylic acid and its salts;
- Ethyl 1-(2,4-difluorophenyl) -6-fluoro -1, 4-dihydro-7- (4-amino-3-ethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;
- 1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-7- (4-amino-3, 5-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylic acid and its salts;
- 15 Ethyl 1-(2,4-difluorophenyl) -6-fluoro-5-methyl-1, 4-dihydro-7- (4-amino-3, 3-dimethylpiperidin-1-yl)- 4-oxo-1,8-naphthyridine-3-carboxylate;
- (S)-(-)-9-fluoro-6,7-dihydro-8- (4'-hydroxy- 3'-fluoropiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- 20 10-Fluoro-11- (4-aminopiperidin-1-yl)-3,4-dihydro-4 (S)-methyl-8-oxo-2H, 8H-pyrido[1,2,3-ef]-1,5-benzoxazipin-7-carboxylic acid and its salt;
- (RS)-(±)-6, 7-dihydro-8- (trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- (RS)-(±)-6, 7-dihydro-8- (cis-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts; and
- 25

(RS)-(±)-6, 7-dihydro-8- (4'-hydroxy-3', 3'-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H, 5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts.

5 312. (New) The pharmaceutical composition of claim 305, further comprising a fluoroquinolone.

313. (New) The pharmaceutical composition of claim 312, wherein said fluoroquinolone is selected from the group consisting of ciprofloxacin, norfloxacin, levofloxacin,
10 cinafloxacin, sitafloxacin, gatifloxacin, moxifloxacin, trovafloxacin, gemifloxacin and nadifloxacin.

314. (New) The pharmaceutical composition of claim 305 or 313, wherein said efflux pump inhibitor is selected from the group consisting of:

15 1-Ethyl-6-fluoro-1, 4-dihydro -7-(1', 2',3',4'-tetrahydroisoquinolin-2-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-fluoro-1, 4-dihydro -7-(4'-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

20 1-Ethyl-6, 8-fluoro-1, 4-dihydro -7-(4'-{2'-(2'-oxazolidin-1-yl) ethyl} piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Ethyl-6, 8-difluoro-1, 4-dihydro -7-{(1 α ,5 α ,6 α)-6-amino-3-azabicyclo [3.1.0]-hex-3-yl} -4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1- ethyl -6, 8-difluoro-1, 4-dihydro -7-(3'-amino-5'-methyl pyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

25 5-Amino-1- ethyl-6, 8-difluoro-1, 4-dihydro -7-(4'-aminopiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-ethyl-6,8-difluoro-1,4-dihydro-7-{4'-(acetamido) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

5-Amino-1-ethyl-6,8-difluoro-1,4-dihydro-7-{(1 α ,5 α ,6 α)-6'-(t-butoxycarbonyl amino)-3-azabicyclo [3.1.0]-hex-3-yl}-4-oxo-quinoline-3-carboxylic acid
5 and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-acetamido-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-amino-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

10 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-acetoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-{4'-(dimethylamino) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

15 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-hydroxy-3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',4',5'-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

20 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3',5'-dimethyl-4'-ethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

1-Cyclopropyl-6-fluoro-1,4-dihydro-5-methyl-7-(4'-ethoxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

25 1-Cyclopropyl-6-fluoro-1,4-dihydro-5-methyl-7-(3',3'-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(dimethylamino)-3'-methyl piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3'-isobutyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3',3'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-3',5'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3'-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(cis-4'-amino-3',5'-dimethylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(4'-hydroxy-3'-aminomethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(5'-amino-2'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{3'-(L-Ala-L-Ala) amino pyrrolidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4'-(di-n-butylamino) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{4'-(t-butoxycarbonyl-L-Ala-L-Ala)aminopiperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'- propionoxy piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'-hydroxy-3',3'-dimethyl-piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-{4'-(1-pyrrolidinyl)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{4'-[(piperidin-4-yl)aminomethyl]-piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-{(1,2',2', 6',6'-pentamethyl piperidin-4-yl)methylamino}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1, 4-dihydro -7-(3',5'-dimethyl morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(4'-cyclopropyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6, 8-difluoro-1, 4-dihydro -7-(3', 5'-dimethyl-4-pivaloyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 Ethyl 6,8-Difluoro-7-(4-hydroxypiperidin-1-yl)-1-(1-phenylthio-3(S)-but-3-yl)-1,4-dihydro-4-oxo-quinoline-3-carboxylate;
- 1-(2'-Trifluoromethylphenyl)-6-fluoro-1, 4-dihydro- -7-(3', 3', 4'-trimethyl piperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-(2'-trifluoromethylphenyl)-6,8-difluoro-1, 4-dihydro -7-(morpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 5-Amino-1-(2'-trifluoromethylphenyl)-6, 8-difluoro-1, 4-dihydro -7-(3',5'-dimethylmorpholin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-(2'-trifluoromethylphenyl)-6, 8-difluoro-1, 4-dihydro -7-(3',5'-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 5-Amino-1- (4'-trifluoromethylphenyl) -6, 8-difluoro-1, 4-dihydro -7-(3'-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1- (4'-Fluorophenyl) -6-fluoro-1,4-dihydro -7-{4'-ethylamino)piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1- (2',4'-Difluorophenyl) -6-fluoro-1, 4-dihydro-7-(3', 5'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (2',4'-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3'-hydroxy-5'-methylpyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1- (2',4'-difluorophenyl) -6, 8-difluoro-1, 4-dihydro -7-(3',3'-dimethyl piperazinyl-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 1-Cyclopropyl-6-fluoro-1, 4-dihydro -7-{(3'-aminoethoxycarbonyl) pyrrolidin-3-yl}-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- 15 1- (2',4'-Difluorophenyl) -6-fluoro-1, 4-dihydro -7-(piperidin-4-yl-amino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- Ethyl-1- (2',4'-difluorophenyl) -6-fluoro-1, 4-dihydro -7- {[1 α ,5 α ,6 α]-3-N-benzyl-3-azabicyclo[3.1.0]hex-6-yl-amino} -4-oxo-naphthyridine-3-carboxylate and its salts;
- 20 1-(2,4-difluorophenyl) -6-fluoro-7-(1-phenyl-4,5,6,7-tetrahydropyrazolo [4,3-c]pyridin-1-yl-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid and is salts;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-carboxamidopiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- (R)-(+)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid L-arginine salt;
- 25

(S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxy-3',3'-dimethylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;

(S)-(-)-N-methylpiperidin-1-yl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

5 (S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;

Ethoxycarbonylmethyl (R)-(+)-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate;

10 N-1-{7-(1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

N-1-{7-(1-cyclopropyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

15 N-1-{7-(1-cyclopropyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-N-3-amino-{7-(1-cyclopropyl-6,8-difluoro-5-amino-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-pyrrolidine;

20 N-1-{7-(1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-N-4-{7-(1-cyclopropyl-6,8-difluoro-5-amino-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperazine;

N-1-{7-(1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-3-amino-{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid)}-pyrrolidine;

25 N-1-{7-(1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinolone-3-carboxylic acid)}-N-4-amino-{7-(1-cyclopropyl-6,8-difluoro-5-amino-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid)}-piperidine;

N-1- {7-(1-cyclopropyl-6-fluoro-5-methyl-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid))-N-3-amino{7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid))}-pyrrolidine;

5 N-1- {7-(1-(2,4-difluorophenyl) -6-fluoro-1, 4-dihydro-4-oxo-1, 8-naphthyridine- 3-carboxylic acid))-N-4- {7-(1-cyclopropyl-6-fluoro-1, 4-dihydro-4-oxo-quinoline-3-carboxylic acid))}-piperazine;

N-3-azabicyclo{7-(1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid))- [1 α ,5 α ,6 α]-N-6-amino-{7-1-(2,4-difluorophenyl)-6-fluoro-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid))- [3.1.0] hexane; and

10 N-1- {7-(1-cyclopropyl-6,8-difluoro-5-amino-1, 4-dihydro-4-oxo-quinolone-3-carboxylic acid))-N-4-amino-{ethyl 2,3,6-trifluorophenyl-4-carboxylate))-piperidine.

315. (New) The pharmaceutical composition of claim 305, further comprising an antimicrobial agent selected from the group consisting of ciprofloxacin, levofloxacin,
15 ofloxacin, gemifloxacin, nadifloxacin azithromycin, erythromycin, tetracycline, linezolid and novobiocin.

316. (New) The pharmaceutical composition of claim 305 or 315, wherein said efflux pump inhibitor is selected from the group consisting of:

20 1-Cyclopropyl-6-fluoro-1, 4-dihydro-5-methyl- 7-(4'-methoxypiperidin -1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

7-Bromo-1-cyclopropyl-6-fluoro-5-methyl-1,4-dihydro-4-oxo-quinoline-3-carboxylic acid and its salts;

25 1-Cyclopropyl-6-fluoro-8-methoxy-1, 4-dihydro -7-(4'-amino-3'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;

- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-methyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{3,3-dimethyl-4'-ethylamino piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-amino-3'-3'-dimethyl piperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-{4'-(dimethylamino) piperidin-1-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(4'-hydroxy-4'-methylpiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 10 1-Cyclopropyl-6-fluoro-8-methoxy-1,4-dihydro-7-(3',3'-dimethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6,8-difluoro-5-methyl-1,4-dihydro-7-(3'-aminomethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 15 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-(3'-aminomethyl-4'-hydroxypiperidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Ethyl-6,8-difluoro-1,4-dihydro-7-(3'-5'-dimethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-ethyl-3'-methylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 20 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(3'-5'-dimethyl-4'-ethylpiperazin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 1-Ethyl-6, 8-difluoro-1, 4-dihydro-7-{(1 α ,5 α ,6 α)-6'-amino-3'-azabicyclo [3.1.0] hex-3'-yl}-4-oxo-quinoline-3-carboxylic acid and its salts;

- 5-Amino-1-(2',4'-difluorophenyl)-6,8-difluoro-1,4-dihydro-7-(3'-aminopyrrolidin-1-yl)-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5-Amino-1-cyclopropyl-6,8-difluoro-1,4-dihydro-7-{{3'-aminoethoxycarbonyl pyrrolidin-3-yl}}-4-oxo-quinoline-3-carboxylic acid and its salts;
- 5 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(pyrrolidin-3'-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- 1-(2',4'-Difluorophenyl)-6-fluoro-1,4-dihydro-7-(piperidin-4'-ylamino)-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- 1-Cyclopropyl-6-fluoro-1,4-dihydro-7-(4'-amino-3'-ethylpiperidin-1-yl)-4-oxo-naphthyridine-3-carboxylic acid and its salts;
- 10 (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid 0.2 hydrate;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid . choline salt;
- 15 (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid. 1-Hydroxyethylpyrrolidine salt;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid. Diethanolamine salt;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate. L-histidine salt;
- 20 (RS)-(±)-9-Fluoro-6,7-dihydro-8-{4'-(D-phenylalanyloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;
- (RS)-(±)-9-Fluoro-6,7-dihydro-8-{4'-(L-α-aspartylloxy) piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;

- (RS)-(±)-9-Fluoro-6,7-dihydro-8-{4'-(L-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid dihydrochloride;
- (S)-(-)-9-Fluoro-6,7-dihydro-8-{4'-(D-leucyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;
- 5 (S)-(-)-9-Fluoro-6,7-dihydro-8-{4'-(L-alanyloxy)piperidin-1-yl}-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid hydrochloride;
- (S)-(-)-Morpholinoethyl-9-fluoro-6,7-dihydro-8-(4'-hydroxypiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylate and its salts;
- (R)-(+)-8,9-difluoro-6,7-dihydro-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2- [S-phenylalanyl-S-lysine methyl ester]carboxamide;
- 10 (RS)-(±)-9-Fluoro-6,7-dihydro-8-(trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- (RS)-(±)-9-Fluoro-6,7-dihydro-8-(cis-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- 15 (S)-(-)-9-Fluoro-6,7-dihydro-8-(trans-4'-hydroxy-3'-methylpiperidin-1-yl)-5-methyl-1-oxo-1H,5H-benzo[i,j]quinolizine-2-carboxylic acid and its salts;
- 7H-Pyrido[1,2,3-de]-1,4-benzoxazine-9-fluoro-2,3-dihydro-3-methyl-10-(4'-hydroxy-3'-ethylpiperidin-1'-yl)-7-oxo-6-carboxylic acid and its salts; and
- 10-Fluoro-11-[(1 α ,5 α ,6 α)-6-amino-3-azabicyclo[3.1.0]hex-3-yl]-3,4-dihydro-4(S)-methyl-8-oxo-2H,8H-pyrido[1,2,3-ef]-1,5-benzoxazepine-7-carboxylic acid, hydrochloride.
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317. (New) A method according to claim 198, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.

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318. (New) A method according to claim 199, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.
- 5 319. (New) A method according to claim 201, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.
- 10 320. (New) A method according to claim 202, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.
- 15 321. (New) A method according to claim 298, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.
- 20 322. (New) A method according to claim 299, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.
323. (New) A method according to claim 301, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.

324. (New) A method according to claim 303, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.

5 325. (New) A method according to claim 305, wherein X is C and R₁ is selected from the group consisting of -CH₂CH₂-, -CH₂Y-, -CH₂CH₂CH₂-, -CH₂CH₂Y-, -CH₂CH₂CH₂CH₂- and -CH₂CH₂CH₂Y- where Y represents NH, O or S.